

Identifying and managing non-complex fractures

Helen Chilvers, Senior Lecturer in Nursing, University of Lincoln, HChilvers@lincoln.ac.uk, emphasises the importance of understanding the bone-healing process and describes the care of patients with bony injuries

Nurses working in a range of settings are likely to meet people who have a bony injury resulting from trauma or minor injury. The number of such encounters is likely to increase, as more urgent care becomes increasingly provided closer to home (Willett, 2017). An understanding of the importance of clinical history, mechanisms of injury, pathophysiology and management of bony limb injuries can reduce pain and improve outcomes in terms of mobility and function.

Importance of hearing the narrative

Regardless of role or setting, the importance of recording an accurate account of events cannot be underestimated. Factors such as the patient's age, ethnicity and socioeconomic status have been shown to correlate with frequency of fragility fracture (Curtis et al, 2016). An awareness of these factors will enable the nurse to undertake proactive risk management to prevent further injury (National Institute for Health and Care Excellence (NICE), 2017).

Likewise, an understanding of the forces involved in an injury can signpost the nurse towards probability of bony involvement and patterns of fracture, reducing the risk of early mismanagement and raising awareness of potential non-accidental injury (Kelley, 2009; Purcell, 2017).

LEARNING OUTCOMES

- Recognise the importance of an accurate account of events in assessing an injury and reducing future risk
- Improve understanding of bony injuries and stages of the healing process
- Be aware of good practice in early management of fractures, and patient advice for ongoing care

Medication factors, such as the use of non-steroidal anti-inflammatory drugs (NSAIDs) or corticosteroids, comorbidity, such as diabetes and smoking status, will affect fracture healing, potentially increasing recovery time and the risk of non-union (Buckley, 2016). Documentation of any assessment should be standardised from first contact with the patient (Nursing and Midwifery Council (NMC), 2015; National Clinical Guideline Centre (NCGC), 2016).

Understanding fractures and bone healing

The annual UK incidence of uncomplicated fractures has been estimated at 3.6% (NCGC, 2016). A non-complex fracture can be considered to be any fracture, excluding head, hip, pelvis, spine or open fracture (NCGC, 2016). It is important to recognise that bony injury does not occur in isolation; localised soft tissue, tendon, ligament and nerve insult can be concurrent and will affect decisions on how to manage the patient.

Bone is a metabolically active substance, with roles in erythropoiesis and mineral storage and release, as well as structural support (Loi et al, 2016). Injuries involving joints can be much more complicated: if fractures extend through articular hyaline cartilage; there may be subsequent risk of post-traumatic osteoarthritis and loss of function (McKinley et al, 2010).

An understanding of the stages of fracture healing can help nurses to give appropriate advice and care throughout the recovery process (Figure 1). This includes being aware of:

- The inflammatory processes
- The formation of granulation tissue between the fracture fragments and cartilage, or soft callus formation towards the depositing of lamellar bone layers
- Final remodelling.

Recognition of the role of splinting and casting in reducing the potential for

biological disruption at the soft callus stage has to be balanced against the benefits of promoting early mobilisation, where appropriate, to support a return to usual muscle tone and activity levels.

Implications for nursing care

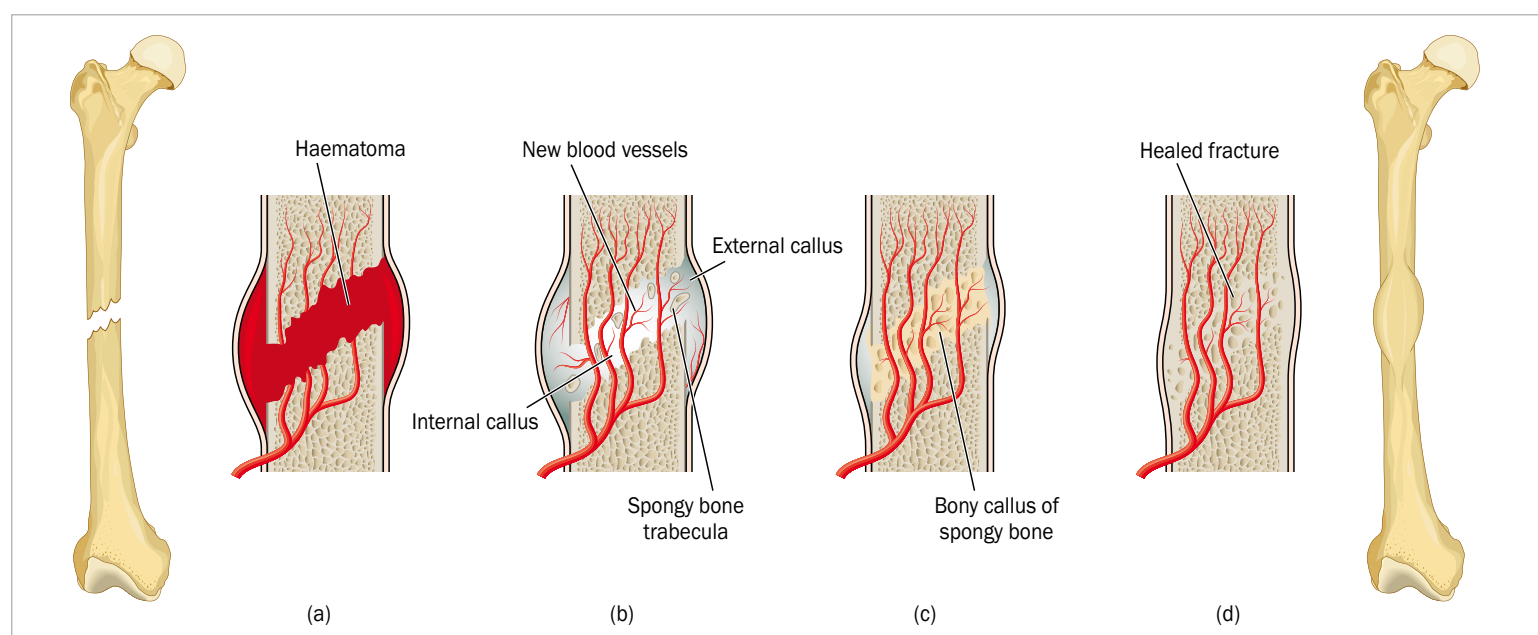
Pain should be adequately managed in acute injury, initially with paracetamol for mild pain, or a combination of paracetamol and codeine for moderate pain. NSAIDs should be avoided in older people with fractures (NCGC, 2016). It is essential to recognise the role of acute inflammation in the very early stages of fracture healing.

The use of clinical prediction tools, such as the Ottawa ankle and knee rules (MDCalc, 2017) can reduce unnecessary exposure to ionising radiation for older children and adults with lower limb injuries by ensuring only those with high clinical suspicion of fracture are referred for X-ray imaging.

Patients should have an opportunity to see images of their fracture, before and after treatment. A radiological report should be made available before they leave the place of care provision. This may have implications for the management of non-complex fractures in a primary care setting, where reporting can take several days to become available, raising the potential for mismanaging the injury (NCGC, 2016).

Close observation of the injured limb in the hours following injury can lead to early detection of limb-threatening complications, such as compartment syndrome in those at risk. Patients at risk include those with tibial and forearm fractures, and high-impact wrist or crush injuries (British Orthopaedic Association (BOA), 2016). Observation must include monitoring pulses, warmth, colour and sensation distal to the injury, and being alert to pain that appears to be out of proportion to the injury.

Where immobilisation is required with



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Figure 1. The four stages of fracture healing: haematoma formation (a), soft callus (b), hard callus (c), remodelling (d)

plaster casting, application should be performed by a qualified practitioner (BOA, 2015). Nurses should recognise the limits of their competency in such situations (NMC, 2015). When casts are used, care needs to be given to preventing pressure damage from a too-tight cast and avoiding damage to skin during cast removal with oscillating saws (A'Court et al, 2017). For many non-complex fractures early mobilisation is advised to maintain range of movement and to enable active patient rehabilitation; this can include weight/load-bearing on arms for upper limb injuries (NCGC, 2016).

Ongoing care

For older people, risk of further fragility fractures should be calculated using tools such as FRAX or QFracture (NICE, 2017).

Smokers should be given cessation advice as they will have twice the risk of experiencing non-union of their fractures, thought to be due to hypoxia and changes in cellular activity induced by some of the toxic components of cigarette smoke (Pearson et al, 2016).

A recognition that even young, fit people experiencing an uncomplicated fracture may have persistent pain for more than 3 months post-injury will ensure that nurses offer appropriate pain relief and non-pharmaceutical coping strategies (Rosenbloom et al, 2013) not only in the initial hours after fracture, but also in the rehabilitative phase. This should be balanced with an awareness that, although incidence

is low at 1.9%, the population most at risk of non-union of long bone fractures is the 25–44-year age group (Mills et al, 2017). Persistent pain in this group should prompt review by an orthopaedic specialist.

Detailed patient information regarding timescales to recovery, permitted activity and potential long-term implications, such as reduced range of movement, stiffness or pain, should be provided in an acceptable format, including details of whom to contact in case of concerns (NCGC, 2016).

Summary

Nurses in a variety of settings are likely to encounter people with non-complex fractures at all stages of injury. An awareness of the underlying physiological process and projected recovery, with factors that affect this, can improve quality of care. **BJN**

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